DOCUMENT RESUME

ED 309 159 SP 031 312

AUTHOR Martin, Giselle O.
TITLE Factors That Are Associated with Change in Teachers' Use of New Materials and Teaching Strategies.
PUB DATE Mar 89
NOTE 39p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, March 27-31, 1989).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Change Strategies; *Institutes (Training Programs); Institutional Cooperation; International Education; Learning Strategies; *Summer Programs; Teacher Attitudes; *Teacher Response; *Teaching Methods

ABSTRACT

Selected findings are presented of a 2-year evaluation study of the impact of three different staff development summer institutes on the use of new teaching materials and interactive strategies by 96 teachers. The purpose of the study was to explore some of the individual and organizational factors that are associated with the adoption of new teaching practices. Change was measured in terms of teachers' self-reported degree of use of international education materials, degree of use of interactive teaching strategies, interest in learning or improving their knowledge of interactive teaching strategies, and perceptions of competence on the use of new materials and teacning strategies. The individual factors examined included: (1) gender and grade level taught; (2) degree of previous experience with and/or interest in learning or using international education materials and/or interactive teaching strategies; and (3) perceived competence in these areas. Organizational factors analyzed included: (1) existant support structure for the teacher implementing change, as measured by the existence of school and/or district teams working together to implement international education programs; (2) teachers' perception of support; and (3) number of contact hours in the training programs. Analysis of the data confirmed the power of organizational linkages between the teachers, the school and the resource center as factors that support change. Teachers' perceptions of competence with regard to the use of international education materials and strategies appeared to be an important factor in understanding their internalization of innovations introduced by this program. (JD)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

ED309159

# FACTORS THAT ARE ASSOCIATED WITH CHANGE IN TEACHERS' USE OF NEW MATERIALS AND TEACHING STRATEGIES

Paper presented at the American Education Research Association Annual Meeting, San Francisco, March 1989

Author: Giselle O. Martin, Ph.D

California International Studies Project/ Stanford University
Institute for International Studies
Littlefield Center, Room 14
Stanford, CA 94305-5013
415-725-1486

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Giselle O. Martin
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

SP031312



BEST COPY AVAILABLE

## ABSTRACT

This paper presents selected findings of a two-year evaluation study of the impact of three different staff development summer institutes on teachers' use of new teaching materials and interactive strategies. The staff development programs evaluated are part of the California International Studies Project (CISP), a legislatively-based effort created in 1986 to improve the international competence of teachers and students.

A central purpose of this study was to explore some of the individual and organizational factors that are associated with the adoption of new teaching practices among pre-collegiate teachers.

Ninety-six teachers participating in summer institutes offered by three different CISP resource centers were the focus of this study. Participants were given a set of baseline measures prior to the summer institutes, and two sets of post-test measures administered at the end of the institutes and between three and sex months after the staff development programs. A sub-sample of 15 teachers was observed in their classroom to supplement quantitative measures. Twenty teachers who did not attend summer institute programs served as a control sample.

Change was measured in terms of teachers' self-reported degree of use of international education materials, degree of use of interactive teaching strategies, interests in learning or improving their knowledge of interactive teaching strategies, and perceptions of competence in the use of new materials and teaching strategies. These measures were validated by observational studies of a sub-sample of the program participants.

The individual factors examined in this research include: (1) gender, (2) grade level taught, (3) degree of previous experience with international education materials and/or interactive teaching strategies, (4) interest in learning and using international education materials and/or interactive teaching strategies, and (5) perceptions of competence using international education materials and/or interactive teaching strategies.

The organizational factors analyzed include: (1) existent support structure for the teacher implementing change, as measured by the existence of school and/ or district teams working together to implement international education programs, (2) teachers' perceptions of support by Resource Center, school district and school principal, (3) number of contact hours in the training programs

This study is based on data gathered from three different summer institutes held in three CISP resource centers. Because the teachers attended different summer institutes, and came from different schools and districts having different relations with the resource centers, there was naturally occurring variation in the organizational variables. These differences were documented and used as part of the analysis of the relationship between these organizational factors, and change in teaching practices and perceptions associated with them.

Analysis of the data obtained confirm the power of organizational linkages between the teacher, the school and the resource center as factors that support change. In terms of the individual variables studied, teachers' perceptions of competence with regard to the use of international education materials and strategies appears to be an important factor in understanding teachers' internalization of the educational innovations introduced by this program. There appear to be numerous and important interactions among some of the variables studied.

TABLE OF CONTENTS


BACKGROUND OF THE STUDY ..... 3

METHODOLOGY ..... 5

RESULTS ..... 7
- Change in outcome measures ..... 7
  - Use of materials ..... 7
  - Use of interactive teaching strategies ..... 9
  - Interests ..... 14
  - Perceptions of competence ..... 19
- Individual factors ..... 23
  - Gender differences ..... 23
  - Grade level ..... 25
- Organizational Factors ..... 27
  - Organizational linkages: more than one trained teacher in school ..... 27
  - Organizational linkages: Affiliation and team membership ..... 27
  - Length of training program ..... 29

CONCLUSIONS ..... 31

REFERENCES ..... 36

## I. BACKGROUND OF THE STUDY

In order to understand how planned educational change occurs, it is important to recognize the importance of both individual and organizational factors.

One central goal of this study was to determine the impact of different organizational and individual factors on change in: 1) teachers' use of international education materials and interactive teaching strategies, 2) interests in improving knowledge or use of such materials and strategies, and 3) perceived competence in using them.

This research addresses the three components or dimensions at stake in implementing any new educational program or policy identified by Fullan (1982): the possible use of new or revised materials, the possible use of new teaching approaches, and the possible alteration of beliefs as outcome measures of a planned change effort. The third component, that is, the alteration of beliefs, has been addressed in this study specifically and only to the extent beliefs are embedded in personal agency factors, which include perceptions of competence. Personal agency factors have been shown to be better predictors of future performance than past or present performance (Bandura, 1986).

The planned change effort in this study involved the training of teachers in international education through intensive summer institute programs sponsored by the California International Studies Project (CISP).

The California International Studies Project (CISP) began as a legislative concept in the state of California in 1985 (AB 2543:Farr). In 1986 it became a working partnership among private foundations, state agencies, and public and private educational institutions. The primary objective of CISP is to improve the international competence of California teachers and students. International competence in this context refers to increased knowledge of world history and world cultures, as well as increased competence and understanding of concepts such as interconnectedness, conflict issues, and multiple perspectives. One way in which this objective is addressed is through staff development summer institutes.

Summer institutes are intensive staff development programs that take place during the summer, range from one to three weeks in length and address a diversity of subjects including world geography, international economics, Latin America, migration issues, etc. Institute participants are primarily pre-collegiate teachers, although principals, district administrators, university faculty, and curriculum specialists attend as well.

The structure of institutes varies from one resource center to another in aspects such as length of daily programs, residential versus commuter programs, availability of university credits for attendance, and cost. There is consistency in specific aspects of the institutes such as the inclusion of a combination of lectures and curriculum demonstrations in all programs, the selection of a topic that has international dimensions, and the provision of multiple opportunities for professional collegial interactions.

Currently there are nine regional CISP international resource centers in California. Resource centers consist of school districts working in collaboration with international resource organizations -- regional educational agencies, universities and community groups-- to enhance international dimensions of school curriculum.

Resource centers utilize the special academic strengths of the resource organizations that support them in order to provide professional growth opportunities for K-12 teachers in affiliated districts. The centers' activities are designed to increase teachers' international knowledge (content) and instructional skills (process).

Organizational linkages which are related to teachers' perception of organizational support have been carefully addressed in this study. Specifically, linkages between the teacher, the school, the school district and the resource center which organize the training programs have been explored.

CISP resource centers provide specific organizational support structures designed to facilitate the interaction between the teacher, school, school district and resource center. These structures take the form of semi-contractual arrangements between all actors. These arrangements result in the "affiliation" of specific districts to a resource center, and in the creation of district "teams" of teachers who represent the affiliated district. Teachers in a team participate in various staff development programs which enable them to organize in-service programs for other teachers in their district. This study explored the influence of these organizational linkages on teachers' change as defined previously.

In order to address the issue of developmental change, teachers with varying degrees of exposure to the innovations presented during the training program were included in this study. It was assumed, based upon evaluations of teachers who attended previous staff development summer institutes, that those participants with substantial prior exposure to the content and the teaching strategies provided by the training program would have a greater degree of internalization of such content and practices, and would use them more in greater variety.

Interest in learning about new materials and strategies and perceptions of one's ability to do so are very important variables in the assessment of the possibilities for change (Bussis, 1976; Ford, 1983, 1985; Lortie, 1975; McLaughlin, 1984). Therefore teacher interest in such learning was explored.

The sample of this study includes primary and secondary teachers. It was expected, based upon an evaluation of 46 teachers who attended a Summer Institute in 1986, and corroborated by the findings of Cuban (1984), that there would be a greater change in the adoption of new teaching practices by elementary teachers than by high school teachers. According to Cuban, the differences between elementary and secondary schools in terms of curricula and instructional methods is such that staff development efforts aimed at the elementary schools offer a lower risk and higher return for the teacher.

## II. METHODOLOGY

Ninety-six teachers participating in summer institutes offered by three different CISP resource centers during the Summer of 1987 were the focus of this research. This study included a baseline set of measures administered prior to the Summer Institutes, and two sets of post-test measures administered at the end of the summer institutes and between three and four months later.

The design strategy for this study consisted of the elaboration and use of measures that captured teachers' interest in and use of materials and teaching strategies before and after the training programs were conducted. These measures were then validated using an observational protocol on a sub-sample of the population who indicated high levels of change as a result of their participation in the summer institute training programs.

The pre- and post-test measures consisted of paper and pencil instruments with mostly multiple-option items on teachers perceptions of their use of materials and teaching strategies, perceptions of competence, interests relating to international education, and perceived support by school principal, district and resource centers.

CISP resource center staff assessed the degree of previous experience in international education of each participant, and, based on that experience, assigned each participant a "degree of previous experience" rating. During the pre-test, participants assigned themselves a degree of experience rating as well. The variable *degree of previous experience,* based on teachers reported hours of participation in different activities and on resource center staff assessment of participants' degree of previous experience resulted in the following distribution:

- 48 teachers (50%) with a low level of prior experience (no previous exposure to global education programs);
- 24 teachers (25%) with a moderate level of prior experience (attended a skill building workshop or several awareness or introductory workshops);
- 24 teachers (25%) with a high level of prior experience (attended a Summer Institute, one or two skill building workshops, several awareness or introductory workshops, or any combination that includes a Summer Institute).

In addition to participating in conferences related to international education, 33 teachers (48.5%) had participated in lectures, workshops, or conferences on geography over the past five years (not including study in formal college or university course).

The grade level distribution for the population was: 53 elementary teachers, 15 middle school teachers and 28 secondary or high school teachers. There were 69 females and 27 males.

Ratings were also assigned by both the center staff and the participant representing the nature of the organizational linkages of each participants to their school district and the resource center (i.e., if the participant was a member of an affiliated district and/or a member of a district team). In terms of participants' affiliation to a CISP Resource Center, 60 teachers (62%) were affiliated and 36 (37.5%) were not. Within the affiliated group 43 teachers were team members.

The inclusion of "length of training program" in the analysis of this planned change effort has important implications for cost-effectiveness. The three summer institutes under study had naturally occurring differences in terms of contact hours, ranging from 65 to 145 hours of contact. A dummy variable was created so that this difference could be used in the analysis.

Twenty teachers identified by the three different resource centers who had attended a single sponsored event but who did not participate in a summer institute programs served as a comparison sample. While some of the teachers in the comparison sample were affiliated to the resource centers, none of the teachers had ever attended a summer institute. Their only exposure to CISP training programs consisted in attending an awareness workshop program (two hour event on an international topic or world area).

The analysis of the comparison group data enhances and substantiates the findings for the teachers who participated in the summer institutes. There are no significant increases from pre- to post test for the control sample.

## III. RESULTS

Pre- and post- test variables were compared to determine whether there had been any changes in teachers' assessment of their teaching practices. Following are the results for the different areas of change under study. The results presented include findings from the pre-test and the first and second post-test administered on the last day of the institute and three to four months after, respectively.

Findings from the first post-test are generally stronger than those from the second post-test. This is understandable given the general feeling of excitement and camaraderie that emerges after a shared program of learning and collegial interaction.

### A. Change in outcome measures

#### 1. Use of materials

In order to ascertain teachers' self-assessed use of international education curriculum materials, teachers were asked to respond to the question: To what extent have you used the centers' resources in international education units, lessons, or activities?

Teachers used a scale of 1 to 5 where 1 meant "to no extent" and 5 meant "to a great extent." TABLE 1 displays the means for self-reported use of international education curriculum units, lessons, and activities in the three measures. These overall means are broken down into the different factors that served as individual variables.

Table I

Means for self-reported use of international education curriculum units, lessons, and activities.

Range: (no extent) 1 2 3 4 5 (great extent)

| | Pre test | | 2nd post-test | | |
|---|---|---|---|---|---|
| Group | Mean | SD | Mean | SD | p |
| Total sample | 2.83 | 1.37 | 3.60 | 0.92 | <.001 |
| Elementary teacher | 2.85 | 1.26 | 3.56 | 0.94 | <.001 |
| Middle teacher | 2.55 | 1.44 | 3.46 | 0.93 | .005 |
| Secondary teacher | 2.90 | 1.56 | 3.77 | 0.86 | .043 |
| Females | 2.87 | 1.37 | 3.56 | 0.96 | <.001 |
| Males | 2.72 | 1.40 | 3.73 | 0.77 | .002 |
| Shortest program | 2.68 | 1.19 | 3.48 | 0.76 | <.001 |
| Moderate program | 2.45 | 1.54 | 3.25 | 0.99 | .022 |
| Longest program | 3.09 | 1.38 | 3.85 | 0.94 | .001 |
| Low exposure | 1.89 | 1.01 | 3.33 | 0.87 | <.001 |
| Moderate exposure | 3.28 | 1.17 | 3.65 | 0.94 | ns |
| High exposure | 4.13 | 0.74 | 4.04 | 0.83 | ns |
| Affiliated teacher | 3.14 | 1.32 | 3.73 | 0.91 | <.001 |
| Unaffiliated teacher | 2.33 | 1.33 | 3.39 | 0.90 | <.001 |
| Team member | 3.56 | 1.14 | 3.90 | 0.92 | ns |
| Non-team member | 2.21 | 1.24 | 3.34 | 0.84 | <.001 |

As can be observed in the preceding table, there is a significant and positive change in all groups except for teachers with a moderate degree of previous exposure and team member (change is positive but not significant for these variables), and for teachers with substantial previous exposure to international education programs (for which there is a negative but non-significant change).

The difference between teachers with varying degrees of previous exposure to international education materials in the pre-test and post-test is noteworthy and illustrates incremental knowledge and awareness of materials in the field of international/global education depending on levels of prior exposure. Further, the lack of positive change for high degree

of previous experience needs to be balanced against the fact that this group was almost at the ceiling level in the pre-test.

Another indicator of teachers' use of international education materials was obtained by asking teachers to what extent they used different types of materials such as textbooks and supplementary materials. Additional indicators of this variable included the extent to which teachers spent time teaching about other cultures, discussed the geographical relevance of events, and examined issues and events from multiple perspectives.

The precision of the preceding measures is limited by the fact that the pre- and second post-test measure were taken at different points in time in the academic cycle. Teachers therefore had to estimate coverage by either looking back to the previous academic year (pre-test) or projecting into an academic year underway (second post-test).

Significant change in the time measures occurred only for the item on extent to which teachers use units, lessons, and curriculum materials on international and global education. The stability of all other items points to the stability in teaching practices in general.

2. Use of interactive teaching strategies

The pattern that emerges in the means for the different variables represented in this section is different to the one for use of teaching materials. Specifically, there appears to be more change over time in teachers' use of interactive teaching strategies than in their use of teaching materials for both the global variable and the various specific variables related to use of teaching strategies. TABLE 2 presents the frequencies of self-reported use of interactive teaching strategies in the pre-test and second post-test.

**Table II**

Means for self-reported use of interactive teaching strategies.

Range: (no extent) 1 2 3 4 5 (great extent)

| | Pre test | | 2nd post-test | | |
|---|---|---|---|---|---|
| Group | Mean | SD | Mean | SD | p |
| Total sample | 2.84 | 1.42 | 3.82 | 0.88 | <.001 |
| Elementary teacher | 2.90 | 1.45 | 3.84 | 0.90 | <.001 |
| Middle teacher | 2.46 | 1.44 | 4.00 | 0.78 | <.001 |
| Secondary teacher | 2.87 | 1.41 | 3.77 | 0.91 | .029 |
| Females | 2.93 | 1.51 | 3.89 | 0.88 | <.001 |
| Males | 2.60 | 1.16 | 3.62 | 0.87 | <.001 |
| Shortest program | 2.71 | 1.30 | 3.82 | 0.74 | <.001 |
| Moderate program | 2.60 | 1.57 | 3.35 | 0.99 | .028 |
| Longest program | 3.02 | 1.44 | 4.08 | 0.83 | <.001 |
| Low exposure | 1.96 | 1.07 | 3.64 | 0.93 | <.001 |
| Moderate exposure | 3.29 | 1.33 | 3.96 | 0.84 | .024 |
| High exposure | 4.04 | 0.96 | 4.04 | 0.77 | ns |
| Affiliated teacher | 3.18 | 1.40 | 4.04 | 0.82 | <.001 |
| Unaffiliated teacher | 2.31 | 1.31 | 3.49 | 0.87 | <.001 |
| Team member | 3.64 | 1.21 | 4.07 | 0.82 | .012 |
| Non-team member | 2.18 | 1.24 | 3.61 | 0.88 | <.001 |

The differences between teachers with varying levels of prior exposure to training programs are noteworthy in both pre and post-measures, with teachers with no prior exposure to training using interactive teaching strategies much less than teachers with substantial prior exposure to the training. Similar differences can be found between team and non-team members and affiliated and non-affiliated teachers.

As can be seen in the preceding table, there were significant gains for all groups except for those with a moderate degree of previous exposure (with positive but not significant change).

The means of affiliated teachers were significantly higher than those of non-affiliated teachers even though the change from pre- to second post-test was significant for both groups. It is of particular importance to note that non-team members changed to a greater extent than team members, although team members showed higher ratings in both the pre-test and the second post-test.

Emerging from the comparison between TABLE 1 and TABLE 2 is that fact that teachers use interactive teaching strategies more than international education materials at the baseline level. On both of these variables teachers with a low degree of previous exposure made the greatest gains between pre-test and second post-test.

Additional items in the pre- and second post-test measures sub-divided "teaching strategies" into specific strategies including role plays, simulations, activities comparing differences and similarities between systems, group discussions, cooperative groups, etc. TABLE 3 presents the means for perceived use of role plays.

**Table III**

Means for self-reported use of role-plays.

Range: (no extent) 1 2 3 4 5 (great extent)

| | Pre test | | 2nd post-test | | |
|---|---|---|---|---|---|
| Group | Mean | SD | Mean | SD | p |
| Total sample | 3.15 | 1.25 | 3.00 | 1.27 | ns |
| Elementary teacher | 3.29 | 1.24 | 3.00 | 1.33 | ns |
| Middle teacher | 3.00 | 1.36 | 3.15 | 1.03 | ns |
| Secondary teacher | 3.08 | 1.24 | 2.91 | 1.31 | ns |
| Females | 3.25 | 1.26 | 3.08 | 1.28 | ns |
| Males | 3.04 | 1.23 | 2.79 | 1.25 | ns |
| Shortest program | 3.26 | 1.23 | 3.15 | 1.13 | ns |
| Moderate program | 2.85 | 1.46 | 2.35 | 1.35 | .014 |
| Longest program | 3.32 | 1.15 | 3.22 | 1.24 | ns |
| Low exposure | 3.19 | 1.33 | 3.07 | 1.20 | ns |
| Moderate exposure | 3.09 | 1.31 | 2.95 | 1.53 | ns |
| High exposure | 3.30 | 1.06 | 2.91 | 1.16 | ns |
| Affiliated teacher | 3.27 | 1.30 | 3.05 | 1.33 | ns |
| Unaffiliated teacher | 3.06 | 1.16 | 2.91 | 1.17 | ns |
| Team member | 3.78 | 0.94 | 3.32 | 1.128 | .042 |
| Non-team member | 3.02 | 1.33 | 2.96 | 1.282 | ns |

The data presented in TABLE 3 illustrates the stability in teachers use of role plays. It also shows the relative homogeneity of use of this teaching strategy among different groups of teachers.

TABLE 4 presents the change in perceived use of cooperative learning groups by teachers.

Table IV

Means for self-reported use of cooperative learning strategies.

Range: (no extent) 1 2 3 4 5 (great extent)

| | Pre test | | 2nd post-test | | |
|---|---|---|---|---|---|
| Group | Mean | SD | Mean | SD | p |
| Total sample | 3.61 | 1.23 | 3.89 | 1.19 | .030 |
| Elementary teacher | 3.63 | 1.31 | 3.88 | 1.24 | ns |
| Middle teacher | 3.79 | 1.12 | 4.07 | 1.27 | ns |
| Secondary teacher | 3.48 | 1.12 | 3.78 | 1.04 | ns |
| Females | 3.67 | 1.25 | 3.97 | 1.17 | .048 |
| Males | 3.46 | 1.18 | 3.67 | 1.24 | ns |
| Shortest program | 3.56 | 1.12 | 4.00 | 1.00 | ns |
| Moderate program | 3.30 | 1.34 | 3.25 | 1.45 | ns |
| Longest program | 3.80 | 1.23 | 4.12 | 1.08 | ns |
| Low exposure | 3.54 | 1.30 | 3.81 | 1.22 | ns |
| Moderate exposure | 3.59 | 1.14 | 3.77 | 1.38 | ns |
| High exposure | 3.78 | 1.20 | 4.13 | 0.92 | ns |
| Affiliated teacher | 3.75 | 1.13 | 4.02 | 1.17 | ns |
| Unaffiliated teacher | 3.38 | 1.36 | 3.65 | 1.21 | ns |
| Team member | 3.71 | 1.11 | 4.09 | 0.96 | .010 |
| Non-team member | 3.52 | 1.33 | 3.70 | 1.35 | ns |

A clear difference between TABLE 3 and TABLE 4 is that teachers in all groups use cooperative learning to a greater extent than role plays. Once again, there was little change between pre and second post-test. The nature of the change is different for both strategies since change is always positive in TABLE 4, whereas it is almost always negative in TABLE 3. One possible explanation for this difference is that cooperative learning was modeled during the summer institutes to a greater extent than use of role plays. TABLE 4 also illustrates the differences at entry level between teachers with differing levels of prior training, and with teachers with different organizational linkages with the resource center in their use of cooperative learning groups. A particularly interesting change is that which occurs between the pre-test and the second post-test for teachers with substantial prior

exposure to the training programs. Even though this group did not change significantly from pre-test to the second post-test, the standard deviation decreased more than it did for teachers with no prior or moderate prior exposure. This pattern is evident in almost all other variables used in this study (i.e., perceived competence to use simulations, interests in incorporating cooperative learning into teaching, etc.).

3. Interests

In the pre-test, teachers were asked to assess their current level of interest in learning and/or improving their use of different interactive teaching strategies. Later, in both post-tests, teachers were asked to rate the level of interest they had in incorporating such strategies into their teaching practices. The scale used for this item ranged from 1 (very weak) to 5 (very strong).

The teaching strategies that participants rated included simulation activities, role plays, group discussions, activities focusing on comparisons of similarities and differences in political, economic, and social systems, cooperative group exercises, and activities involving the use of textbook supplements.

Level of interest was very high in the pre-test and post-test for most items. This is understandable and expected given that teachers attended this institute voluntarily, choosing to participate in an intensive training program during the summer.

TABLE 5 illustrates changes for the different groups in interest to learn and to incorporate cooperative learning.

**Table V**

Means for self-reported interests to learn and incorporate cooperative learning.

Range: (no interest) 1 2 3 4 5 (great interest)

| | Pre test | | 1st post-test | | | 2nd post-test | | | |
|---|---|---|---|---|---|---|---|---|---|
| Group | Mean | SD | Mean | SD | p1 | Mean | SD | p2 | p3 |
| Total sample | 4.32 | 0.78 | 4.62 | 0.72 | <.001 | 4.38 | 0.75 | ns | .001 |
| Elementary teachers | 4.35 | 0.78 | 4.79 | 0.41 | <.001 | 4.49 | 0.67 | ns | .003 |
| Middle teachers | 4.50 | 0.67 | 4.50 | 1.00 | ns | 4.27 | 0.79 | ns | ns |
| Secondary teachers | 4.23 | 0.81 | 4.39 | 0.92 | ns | 4.22 | 0.85 | ns | ns |
| Females | 4.41 | 0.71 | 4.70 | 0.60 | <.001 | 4.46 | 0.66 | ns | .003 |
| Males | 4.08 | 0.89 | 4.42 | 0.94 | ns | 4.13 | 0.92 | ns | ns |
| Shortest program | 4.14 | 0.85 | 4.67 | 0.56 | .001 | 4.52 | 0.64 | .040 | ns |
| Moderate program | 4.24 | 0.77 | 4.29 | 1.06 | ns | 3.85 | 0.91 | ns | .025 |
| Longest program | 4.47 | 0.72 | 4.75 | 0.57 | .005 | 4.54 | 0.55 | ns | .027 |
| Low exposure | 4.17 | 0.84 | 4.49 | 0.88 | .025 | 4.24 | 0.85 | ns | ns |
| Moderate exposure | 4.40 | 0.76 | 4.76 | 0.52 | .002 | 4.48 | 0.67 | ns | .016 |
| High exposure | 4.54 | 0.59 | 4.74 | 0.45 | ns | 4.52 | 0.59 | ns | .057 |
| Affiliated teacher | 4.32 | 0.78 | 4.71 | 0.50 | <.001 | 4.48 | 0.64 | ns | .009 |
| Unaffiliated teacher | 4.32 | 0.78 | 4.49 | 0.96 | ns | 4.21 | 0.88 | ns | .048 |
| Team member | 4.47 | 0.70 | 4.71 | 0.51 | .003 | 4.54 | 0.64 | ns | ns |
| Non-team member | 4.21 | 0.82 | 4.55 | 0.85 | .007 | 4.23 | 0.81 | ns | .004 |

p1: t test between pre and first post-test
p2: t test between pre and second post-test
p3: t test between first and second post-test

Overall, there was no significant change in teachers' interest in this strategy from the pre- to the first-post, with a significant decrease from the first-post to the second post. The nature of the change in interest for this variable is odd in light of significant and positive changes in the use of and competence to use this strategy. A possible explanation is that as teachers become increasingly competent to use various teaching strategies, their interests shift to areas in which they feel a need to become more competent with. Another explanation is that interest started very high; became increasingly higher as attention focused directly on the teaching strategies, then dropped back to the original high level.

Another possible interpretation for the decrease in teachers interest to use cooperative learning relates to the nature of this teaching strategy. Teachers may perceive cooperative learning as a complex set of teaching strategies which requires more intensive exposure than just a summer institute program for mastery. Further, the successful use of cooperative learning requires significant shifts in teachers' allocation of responsibility and interaction with students.

It appears that many teachers feel less competent in using and more interested in learning or incorporating specific teaching strategies. There seems to be an inversely proportional relationship between competence and interest when competence is defined in terms of self-efficacy and interests are defined as the intention to learn more or improve knowledge and use of a given strategy.

TABLE 6 presents means of teachers' interest to learn and incorporate role plays into their teaching.

**Table VI**

Means for self-reported interest to learn and to incorporate role-plays.

Range: (no interest) 1 2 3 4 5 (great interest)

| | Pre test | | 1st post-test | | | 2nd post-test | | | |
|---|---|---|---|---|---|---|---|---|---|
| Group | Mean | SD | Mean | SD | p1 | Mean | SD | p2 | p3 |
| Total sample | 3.99 | 1.01 | 4.28 | 0.90 | .001 | 3.85 | 1.12 | ns | <.001 |
| Elementary teacher | 4.12 | 0.92 | 4.42 | 0.78 | .016 | 3.92 | 1.10 | ns | <.001 |
| Middle teacher | 3.93 | 1.22 | 4.27 | 1.03 | .019 | 4.07 | 0.92 | ns | ns |
| Secondary teacher | 3.79 | 1.07 | 4.00 | 0.98 | ns | 3.58 | 1.25 | ns | .031 |
| Females | 4.09 | 0.96 | 4.38 | 0.83 | .010 | 3.98 | 1.00 | ns | .001 |
| Males | 3.74 | 1.13 | 4.04 | 1.02 | .030 | 3.50 | 1.35 | ns | .010 |
| Shortest program | 4.19 | 0.92 | 4.37 | 0.74 | ns | 3.93 | 1.04 | ns | .030 |
| Moderate program | 3.65 | 1.14 | 3.90 | 1.26 | ns | 3.10 | 1.33 | .040 | .005 |
| Longest program | 4.10 | 1.00 | 4.46 | 0.71 | .012 | 4.17 | 0.92 | ns | .021 |
| Low exposure | 3.96 | 1.05 | 4.19 | 1.00 | .033 | 4.00 | 1.02 | ns | .027 |
| Moderate exposure | 3.92 | 1.02 | 4.54 | 0.66 | .001 | 4.00 | 1.11 | ns | .045 |
| High exposure | 4.13 | 0.97 | 4.22 | 0.85 | ns | 3.43 | 1.24 | <.001 | .002 |
| Affiliated teacher | 4.02 | 1.03 | 4.39 | 0.79 | .003 | 3.87 | 1.23 | ns | <.001 |
| Unaffiliated teacher | 3.94 | 1.01 | 4.11 | 1.04 | ns | 3.76 | 0.97 | ns | .026 |
| Team member | 4.02 | 1.00 | 4.48 | 0.74 | .004 | 3.85 | 1.30 | ns | .001 |
| Non-team member | 3.96 | 1.04 | 4.13 | 0.98 | ns | 3.85 | 0.96 | ns | .008 |

p1: t test between pre and first post-test
p2: t test between pre and second post-test
p3: t test between first and second post-test

In general, teachers were more interested in learning or using cooperative learning groups than they were in learning or using role plays at the baseline level. In the second post-test, teachers interest to learn and incorporate role plays remained the same or was slightly lower than the baseline level.

Additional measures of interest included asking teachers in the pre-test and post-tests to what extent they were interested in incorporating materials and information on

global/international education into an existing course. TABLE 7 presents the distribution of teachers' interest in this area.

**Table VII**

Means for self-reported interest to incorporate materials and information on international/global education into an existing course.

Range: (no interest) 1 2 3 4 5 (great interest)

| | Pre test | | 1st post-test | | | 2nd post-test | | | |
|---|---|---|---|---|---|---|---|---|---|
| Group | Mean | SD | Mean | SD | p1 | Mean | SD | p2 | p3 |
| Total sample | 4.28 | 0.93 | 4.73 | 0.49 | <.001 | 4.37 | 0.92 | ns | <.001 |
| Elementary teacher | 4.12 | 1.02 | 4.70 | 0.54 | <.001 | 4.31 | 1.08 | ns | .014 |
| Middle teacher | 4.29 | 1.14 | 4.71 | 0.47 | ns | 4.71 | 0.75 | ns | ns |
| Secondary teacher | 4.50 | 0.58 | 4.82 | 0.39 | .017 | 4.50 | 0.66 | ns | .017 |
| Females | 4.20 | 0.99 | 4.74 | 0.51 | <.001 | 4.36 | 0.97 | ns | .003 |
| Males | 4.41 | 0.80 | 4.74 | 0.45 | .047 | 4.38 | 0.82 | ns | .047 |
| Shortest program | 4.38 | 0.75 | 4.77 | 0.43 | .022 | 4.28 | 0.89 | ns | .016 |
| Moderate program | 4.10 | 0.94 | 4.67 | 0.66 | .024 | 3.90 | 1.25 | ns | .024 |
| Longest program | 4.27 | 1.03 | 4.76 | 0.44 | .002 | 4.28 | 0.89 | ns | ns |
| Low exposure | 4.30 | 0.88 | 4.68 | 0.56 | .013 | 4.19 | 1.12 | ns | .015 |
| Moderate exposure | 3.17 | 0.92 | 4.75 | 0.44 | .002 | 4.45 | 0.69 | ns | .005 |
| High exposure | 4.29 | 1.10 | 4.86 | 0.36 | .019 | 4.64 | 0.58 | ns | .056 |
| Affiliated teacher | 4.13 | 1.03 | 4.75 | 0.44 | .002 | 4.45 | 0.69 | ns | .005 |
| Unaffiliated teacher | 4.47 | 0.66 | 4.72 | 0.57 | ns | 4.21 | 1.22 | ns | .036 |
| Team member | 4.10 | 1.13 | 4.78 | 0.42 | <.001 | 4.54 | 0.64 | .030 | .001 |
| Non-team | 4.38 | 0.75 | 4.71 | 0.54 | .008 | 4.22 | 1.09 | ns | .011 |

p1: t test between pre and first post-test
p2: t test between pre and second post-test
p3: t test between first and second post-test

As can be seen in TABLE 7, teachers' were highly interested in incorporating materials into an existing course at all three times of measurement. Even though their interest was not as high in the second post-test as it was in the first-post test, for the most part, it was higher than in the baseline test. Interest was greater for teachers' with increasing levels of prior

exposure and for affiliated teachers and team members. The change from pre- to second post-test for the latter two groups was statistically significant.

The differences between teachers with varying levels of prior exposure to international education is highlighted by the significant decrease from pre-test to second post-test for teachers with no prior exposure and teachers with moderate prior exposure to international education.

4. Perceptions of competence

An analysis of data from all tests reveals that findings from the first post-test are generally higher than those from the second post-test. This is understandable given the general feeling of excitement and camaraderie that emerges after a shared program of learning and collegial interaction. The precise nature of the differences between the two post-tests is fairly consistent for all variables measuring perceptions of personal agency and interests.

Teachers were asked to assess their perceived competence in using different teaching strategies. TABLE 8 presents the means for teachers' self-reported competence to use cooperative learning for the pre and second post-tests.

**Table VIII**

Means for self-reported competence to use cooperative learning strategies.

Range: (no competence) 1 2 3 4 5 (great competence)

| | Pre test | | 1st post-test | | | 2nd post-test | | | |
|---|---|---|---|---|---|---|---|---|---|
| Group | Mean | SD | Mean | SD | p1 | Mean | SD | p2 | p3 |
| Total sample | 3.54 | 1.01 | 4.24 | 0.75 | <.001 | 4.01 | 0.79 | <.001 | .026 |
| Elementary teacher | 3.62 | 0.95 | 4.30 | 0.72 | <.001 | 4.12 | 0.83 | <.001 | ns |
| Middle teacher | 3.17 | 1.40 | 4.08 | 0.79 | .007 | 4.00 | 0.63 | .022 | ns |
| Secondary teacher | 3.48 | 0.96 | 4.17 | 0.79 | .015 | 3.80 | 0.71 | ns | ns |
| Females | 3.57 | 1.04 | 4.26 | 0.74 | <.001 | 4.03 | 0.81 | <.001 | .027 |
| Males | 3.44 | 0.92 | 4.16 | 0.80 | .041 | 3.96 | 0.72 | ns | ns |
| Shortest program | 3.56 | 0.89 | 4.33 | 0.68 | <.001 | 4.11 | 0.85 | .013 | ns |
| Moderate program | 3.67 | 1.07 | 4.00 | 0.84 | ns | 3.79 | 0.63 | ns | ns |
| Longest program | 3.47 | 1.06 | 4.28 | 0.75 | <.001 | 4.05 | 0.81 | .001 | ns |
| Low exposure | 3.41 | 1.02 | 4.20 | 0.81 | <.001 | 3.95 | 0.76 | .003 | ns |
| Moderate exposure | 3.60 | 1.04 | 4.16 | 0.80 | .008 | 3.96 | 0.84 | ns | ns |
| High exposure | 3.71 | 0.96 | 4.39 | 0.58 | <.001 | 4.17 | 0.78 | .038 | ns |
| Affiliated teacher | 3.66 | 0.95 | 4.35 | 0.69 | <.001 | 4.20 | 0.71 | <.001 | ns |
| Unaffiliated teacher | 3.35 | 1.09 | 4.06 | 0.83 | <.001 | 3.70 | 0.81 | .041 | .014 |
| Team member | 3.61 | 1.03 | 4.36 | 0.69 | <.001 | 4.20 | 0.78 | <.001 | <.001 |
| Non-team member | 3.48 | 1.00 | 4.14 | 0.79 | <.001 | 3.85 | 0.76 | .031 | ns |

p1: t test between pre and first post-test
p2: t test between pre and second post-test
p3: t test between first and second post-test

An analysis of the means in the pre-test and the second post-test in TABLE 8 reveals significant and positive change for the overall sample between pre-test and first post-test and between pre-test and second post-test. There is also a significant decrease between first and second test for this variable. This pattern is similar for the different groups of teachers. It is noteworthy that even though the second post-test means are smaller than the first post-test means, they are not significantly smaller for most groups. This suggests that

the change in perceived competence to use this strategy is sustained several months after the training program.

Overall, teachers in all groups were at similar levels of perceived competence in the pre-test, but manifested significant changes on both post-tests. Although there were no statistically significant differences between the various groups, the means of teachers with substantial prior experience to the training programs were higher than those with no prior experience. Similarly, the means of affiliated teachers and those of team members were higher than those of non-affiliated and non-team members.

TABLE 9 presents the means for teachers' self-reported competence to use role plays for the pre and second post-tests.

Table IX

Means for self-reported competence to use role-plays.

Range: (no competence) 1 2 3 4 5 (great competence)

| | Pre test | | 1st post-test | | | 2nd post-test | | | |
|---|---|---|---|---|---|---|---|---|---|
| Group | Mean | SD | Mean | SD | p1 | Mean | SD | p2 | p3 |
| Total sample | 3.26 | 1.01 | 3.93 | 0.94 | <.001 | 3.56 | 0.99 | .013 | <.001 |
| Elementary teacher | 3.33 | 1.05 | 3.94 | 0.88 | <.001 | 3.65 | 0.97 | .022 | .018 |
| Middle teacher | 3.33 | 1.05 | 4.07 | 0.88 | .006 | 3.64 | 0.84 | ns | .054 |
| Secondary teacher | 3.07 | 0.94 | 3.82 | 1.09 | <.001 | 3.30 | 1.11 | ns | .013 |
| Females | 3.34 | 1.01 | 3.96 | 0.93 | <.001 | 3.63 | 0.79 | .008 | .003 |
| Males | 3.04 | 0.98 | 3.85 | 0.99 | <.000 | 3.38 | 1.10 | ns | .010 |
| Shortest program | 3.41 | 0.97 | 3.93 | 0.87 | .010 | 3.65 | 0.98 | .032 | ns |
| Moderate program | 3.24 | 1.26 | 3.52 | 1.25 | .010 | 3.05 | 1.23 | ns | .047 |
| Longest program | 3.17 | 0.90 | 4.11 | 0.77 | <.001 | 3.75 | 0.78 | .005 | .002 |
| Low exposure | 3.15 | 1.03 | 3.77 | 0.99 | <.001 | 3.67 | 0.98 | .003 | ns |
| Moderate exposure | 3.48 | 0.95 | 4.09 | 0.85 | .001 | 3.48 | 1.08 | ns | .029 |
| High exposure | 3.26 | 1.01 | 4.09 | 0.90 | <.001 | 3.43 | 0.95 | ns | .001 |
| Affiliated teacher | 3.48 | 1.01 | 4.09 | 0.92 | <.001 | 3.65 | 1.02 | ns | .001 |
| Unaffiliated teacher | 2.89 | 0.89 | 3.67 | 0.93 | <.001 | 3.39 | 0.92 | .017 | .039 |
| Team member | 3.44 | 1.03 | 4.20 | 0.90 | <.001 | 3.63 | 1.07 | ns | .001 |
| Non-team member | 3.11 | 0.97 | 3.72 | 0.93 | <.001 | 3.49 | 0.92 | .027 | .022 |

p1: t test between pre and first post-test
p2: t test between pre and second post-test
p3: t test between first and second post-test

TABLE 9 shows a pattern of change similar to that displayed in TABLE 8 in that teachers ratings are not as high on the second post-test, but they are still relatively higher than the ratings on the pre-test for more sub-groups.

In general, teachers felt more competent to use cooperative learning groups than role plays at both the pre-test and the second post-test.

Additional measures of general competence were examined in this study, including ratings of teachers' perceived increase in their professional competence to make presentations to other teachers, and in their overall professional competence in international education resulting from their participation in the summer institute training program. Teachers made ratings on both measures in the first and second post-test.

The overall mean for perceived competence to make presentations to other teachers in the first post-test was 3.49 (SD = .59) using a scale of 1 to 4, where 1 means no increase in competence and 4 means much increase). The mean for the second post-test for this variable was 3.32 (SD = .78). The difference between the two means was statistically significant ($p$ = .028). All sub-groups of teachers decreased in their perceived competence from first to second post-test except for teachers with moderate prior experience (although their increase was not significant).

A similar pattern of change was found for the variable measuring increase in overall professional competence in international education. The overall mean in the first post-test was 4.46 (SD = .73) using a scale of 1 to 5, where 1 means no increase and 5 means much increase in professional competence. The overall mean for the second post-test was 4.03 (SD = .97), with this difference being statistically significant ($p < .001$).

The preceding findings may be the result of the realization on the part of teachers, as they return to their classrooms, of what they did not learn, or stated differently, of the limitations in their competence.

B. Individual factors

1. Gender differences

T-tests using gender as an independent variable showed significant differences between males and females in the use of various classroom activities such as reading from textbooks using textbook activities, singing songs and listening to music from other nations, teaching about current events, and using cooperative group exercises.

A MANOVA using all predictors clearly evidenced the interaction between gender and grade level in a number of the variables in which there were significant findings. This interaction is not surprising given the preponderance of elementary teachers who are women and that most male teachers teach at the secondary level. These interactions are currently under study.

2. Degree of previous exposure

In order to understand better the effects of accumulated learning and developmental change, it was important to explore the extent to which prior exposure to and knowledge of international studies content through staff development summer institutes was a factor in the acquisition of new teaching practices.

The analysis of all dependent variables in light of this factor shows that there are clear differences between teachers with different degrees of previous exposure to international education; teachers with higher degree of exposure displayed higher means than the other teachers on the pre-test. The fact that teachers with substantial prior exposure to the training had ratings at the far end of the scale accounts for the lack of dramatic change for these teachers on the post-test.

Results from the multivariate analysis of variance using all predictors on data from the second post-test reveal that degree of previous experience was a significant factor in teachers' sense of increased professional competence to make presentations to other teachers, as well as in their overall professional competence in international education as a result of their participation in the summer institute ($F = 3.82$, $DF = 4, 72$, $p = .007$). A significant interaction was found between degree of previous experience and length of training program. This interaction deserves further study.

The fact that teachers with high levels of prior experience were at the end of the scale in the measures of change, while teachers with no prior exposure changed the most from the first to the third measure does not allow a further examination of how this variable affects future use and personal agency factors. However, it is possible that a small amount of change in teachers with substantial prior exposure are comparable to a large amount of change in teachers with little or moderate prior exposure. The data from the different measures suggest that there may be a cumulative effect of degree of previous experience on at least some of the outcome measures. Teachers with higher levels of previous experience used more materials and interactive teaching strategies to begin with. Thus, they had already *adopted* the innovations prior to the summer institute training. Greater familiarity with the materials and strategies may account for their increased perceptions of competence as professionals in general and as trainers of other teachers, as well as their high level of perceived competence in using these materials and strategies.

3. Grade level

Even though there were some significant differences between elementary, middle, and high school teachers in terms of their overall use of international education materials, the differences between these three groups in terms of specific variables are subtle and do not always follow a consistent trend. For example, middle teachers use textbooks more than elementary and secondary teachers, and use supplementary materials as much as high school teachers. They were between elementary and high school teachers in their time spent teaching about world cultures, in their discussion of current events, and in the examination of events from multiple points of view.

In terms of use of teaching strategies, middle teachers used some strategies less than elementary or secondary teachers (i.e., role plays), and some strategies more than these two groups (i.e., cooperative groups). However, they felt less competent but more interested in using cooperative learning than either elementary or secondary teachers. Middle teachers were in between elementary and secondary teachers in their interest to incorporate materials into an existent course. Further, middle teachers gave the lowest ratings to principal support in both pre-test and post-test, while giving the resource center the largest ratings of perceived support on the post-test.

The univariate ANOVAS using grade level as an independent variable on teachers' interests, perceptions of competence, and use of materials and interactive teaching strategies yielded a number of statistically significant results. Grade level made a difference in terms of time devoted to the study of foreign cultures ($F = 4.07$, $p = .021$) and the extent to which teachers read from a textbook ($F = 4.76$, $p = .011$), discussed current events ($F = 8.07$, $p = .006$), examined issues from multiple perspectives ($F = 3.39$, $p = .039$), conducted field trips ($F = 13.3$, $p < .001$), and conducted individual projects ($F = 3.09$, $p = .05$). Grade level also had an effect on teachers' interest in using activities comparing similarities and differences between cultures ($F = 3.05$, $p = .05$) and those involving the use of textbook supplements ($F = 3.99$, $p$ .02). Grade level also made a difference in teachers' ratings of the school district's support services in the area of providing information about materials and resources ($F = 4.27$, $p = .017$). Finally, there were significant differences due to grade level in teachers' perceived discretionary power to select textbooks in the area of international/global education ($F = 3.25$, $p = .04$).

The full model MANOVA clarified the nature of the differences by grade level, by pointing out the interaction between grade level and gender. This interaction was statistically significant for perceived resource center support (Hotellings = .62, Approx. F = 3.22, DF =

6, 62, $p$ = .008). Grade level was a significant factor in classroom practices such as using maps in the discussion of current events (Hotellings = 1.75, Approx. F = 2.37, DF = 13, 38, $p$ = .017), and in perceived resource center support (F = 3.76, $p$ = .033).

A refined MANOVA with fewer factors in the equation, including length of training, gender, grade level, degree of previous experience, and the interactions between length of training and gender, gender and grade level, and gender and degree of previous experience resulted in significant findings for grade level as a factor on teachers' use of teaching practices, including: preparing and tasting foods from other nations, conducting individual projects, using a map or globe to locate countries, singing songs in different languages, and voting to make a group or class decision (Hotellings = 2.24, Approx. F = 1.84, DF = 28, 46, $p$ = .032).

The interaction between grade level and gender was a significant factor on teachers' practices such as conducting individual projects, using small group projects and using a map to locate different countries (Hotellings = 2.80, Approx. F = 2.30, DF = 28, 46, $p$ = .006).

The interaction between grade level and degree of previous experience resulted in significant univariate values for teachers' assessment of the effectiveness of the district in demonstrating materials and approaches by skilled professionals (F = 3.09, $p$ = .028), and in providing opportunities for teachers to attend lectures (F = 2.58, $p$ = .05) . This interaction was also significant for perceived support by principal (F = 2.65, $p$ = .049), whereas the interaction between gender and grade level was significant for perceived resource center support (F = 4.79, $p$ = .014).

Scatterplots on the different grade level groupings did not evidence any unusual patterns for middle teachers; that is, the changes in middle teachers were not due to one or two teachers responding to the items in dramatically different ways.

The discovery that middle teachers sometimes behaved like elementary teachers while at other times behaved like secondary teachers deserves further study. These findings need to be qualified given that middle teachers constituted only 15.6% of the sample in this study (N = 15). Nevertheless, further research conducted to determine in what specific ways middle teachers are different than elementary or secondary teachers could be particularly informative and useful.

## C. Organizational Factors

One important objective of this study was to explore the influence of various organizational variables on teachers change in their use of international education materials, teaching strategies and perceived competence in both of the preceding areas.

The organizational variables explored included: 1) the presence of additional teachers in the participants' school who attended international education programs sponsored by the resource center, and 2) existent organizational linkages between the school teacher, his/her school and district, and the resource center sponsoring the summer institute. Two types of possible linkages were defined: 1) a formal contractual affiliation between the teacher, the school district and the resource center, (IV=affiliation) and within this affiliation, 2) the possibility that the teacher was engaged in activities at both the school and resource center as a team member representing his/her school district (IV=team).

### 1. Organizational linkages: more than one trained teacher in school

T-tests comparing teachers who had identified other teachers in their school who had participated in the resource centers' training programs showed few significant differences between groups. Teachers who reported interacting with other teachers in their school perceived higher levels of district support ($t = 2.22$, $p = .029$) than did teachers who worked in schools in which they assumed that no other teacher received resource center training. Teachers working with other teachers who had participated in previous training activities scored higher in their assessment of school district services regarding the availability of speakers for classrooms or staff development programs ($t = -2.54$, $p = .042$). Teachers who worked alone scored higher in their assessment of resource center services regarding the provision of opportunities to borrow or purchase materials on international education ($t = 2.87$, $p = .005$), or availability of a staff person who can answer questions in the area of international education ($t = 2.04$, $p = .045$).

Given the limitations of independent tests of means and realizing that some of the variables in this study are very highly correlated, the preceding findings need to be replicated through more further research.

### 2. Organizational linkages: Affiliation and team membership

Results from multiple t-tests examining the impact of "affiliation" on all outcome variables revealed significant differences between affiliated and non-affiliated teachers. For example,

affiliated teachers used interactive teaching strategies to a greater extent than unaffiliated teachers ($t = -3.05$, $p = .003$), and felt more competent using cooperative group exercises (-2.42, $p = .017$). Unaffiliated teachers reported feeling more competent using textbook supplements ($t = 1.95$, $p = .05$). Affiliated teachers perceived greater support from their school principal ($t = -2.60$, $p = .011$), school district ($t = -3.42$, $p = .001$), and resource center ($t= -2.31$, $p = .024$) than did unaffiliated teachers.

A multiple analysis of variance using all predictors was used to further analyze the effect of affiliation on the dependent variables. Affiliation emerged as a significant factor for use of interactive teaching strategies (Hotellings = .287, F = 2.59, DF = 4, 72, $p = .044$). It was also a significant factor in teachers' interest in attending future international education training courses (Hotellings = .666, F = 3.22, DF 6, 29, $p = .015$).

The interaction of affiliation and length of training program was significant in teachers' attributed overall professional competence in international education and in their competence to make presentations to other teachers as a result of participating in the training programs (Hotellings = .425, F = 3.82, DF = 4, 72, $p = .007$). This interaction was also significant for teachers' perceived level of resource center support (Hotellings = .513, F = 2.65, DF 6, 62, $p = .008$).

The results of the preceding analysis are based on an analysis of variance which combined all independent variables. This analysis is more reliable than one using separate ANOVAS for each individual factor since these factors are interrelated and often interacting with one another. However, a refined MANOVA using fewer predictors was done so that the nature of the effects and interactions could be further determined. In the refined MANOVA, affiliation was a significant factor in teachers' use of materials and strategies (Hotellings = .2314, F = 4.28, DF = 2, 37, $p = .021$).

T-tests using data from the second post-test, comparing team and non-team members, for the dependent variables assessing change, revealed a significant difference between the two groups in the use of curriculum materials ($t = -3.06$, $p = .003$) and interactive teaching strategies ($t = -2.21$, $p = .030$). In both cases team members scored higher than non-team members.

Significant differences between team members and non-members were apparent for other important variables such as perceived increase in teachers' competence to make presentations to other teachers as a result of having participated in the summer institute ($t = -2.27$, $p = .026$), use of simulations in the classroom ($t = 2.17$, $p = .033$), and interest in

introducing (t = -2.71, $p$ = .008), incorporating (t = -1.92, $p$ = .05), and securing materials in international education (t = -2.22, $p$ = .029). Further, team members perceived a greater degree of support by their principal (t = -3.14, $p$ = .002), and their school district (t = -5.18, $p$ < .001) than non-team members. They also felt they that had more discretionary power to select and use textbooks (t = -3.31, $p$ = .001) and supplementary materials in the field of international education.

The findings are not surprising or inconsistent with the quality of experiences designed to meet the needs of district and resource center teams. In addition to participating in intensive staff development training programs such as summer institutes, team members usually meet several times during the school year planning and organizing staff development workshops and other training opportunities for other teachers in their schools and districts.

To explore the relationship between affiliation and team and to ascertain their separate effects on the outcome measures, a multiple comparison MANOVA was used controlling for affiliation. This analysis revealed hardly any differences between team and non-team members. The only two significant findings were in teachers' use of textbooks, where team members scored higher than non-team members (F = 4.42, $p$ = .04), and perceived levels of resource center support, where team members again scored higher than non-team members (F = 8.82, $p$ = .004). Marginally significant results were found for teachers' use of interactive teaching strategies (F = 3.72, $p$ = .059), with team members scoring higher than non-team members.

3. Length of training program

A univariate analysis of variance showed that *length of training program* was a significant factor in teachers' use of role plays, simulations, and cooperative learning. Length of training was a significant factor in a MANOVA for teachers sense of professional competence in the field of international education (F = 4.16, $p$ = .023) and competence to make presentations to other teachers (F = 3.83, $p$ = .030). There were also significant interactions between length of training program and affiliation and length of training program and degree of previous experience for these variables (Hotellings = .42, F = 3.83, DF = 4,72, $p$ = .007).

Length of training was also significant for teachers in a MANOVA for teachers' interest in incorporating simulations (F = 6.30, $p$ = .004), role plays (F = 7.71, $p$ = .002), activities comparing different economic, political and social systems (F = 3.56, $p$ = .039), and

cooperative learning to classroom activities (F = 6.93, $p$ = .003). It was also a significant factor in a MANOVA on perceived support by resource center (F = 7.30, $p$ = .002).

Length of training was also a significant factor in a MANOVA for teachers' perceived competence to use role plays (F 3.22, $p$ .052), and for interests to introduce a unit on global/international education into an existing course (F = = 7.35, $p$ = .002), incorporate materials and information on global/ international education into an existing course (F = 4.34, $p$ = .021), rewrite a course to include global/international issues (F = 4.17, $p$ = .024), identify and secure materials on global/international issues (F = 3.24, $p$ = .051), and attend future global/international education workshops (F = 4.82, $p$ = .014).

A refined MANOVA using fewer predictors identified length of training as a significant factor in teachers' attributed competence to use simulations and role plays resulting from their participation in the summer institute (F 3.85, $p$ .031).

Although it appears as though length of training is a significant factor in explaining change for different outcome measures, caution should be exercised in the conclusions derived from these results given the way that this variable was created. Specifically, because length of training program was created as a dummy variable resulting from different numbers of contact hours provided by the training programs, it is unclear whether the differences that are reported below are due to the length of training or to other elements of the training program.

One of the variables interacting with length of training is the resource center's organizational history and relationships with teachers in their proximal geographical area. One probable area of difference is the degree of legitimacy the resource center has with schools and districts in the area it serves. Another is the difference in the number of affiliated districts served by the resource center.

Further, the differences outlined in this section suggest that although the goals of the summer institutes were comparable, a number of differences during the training could account for some of the significance attributed to the factor *length of training*. These differences deserve further scrutiny. Moreover, the effect of length of training program needs to be confronted to findings from other variables. For example, participants with high levels of previous experience showed stronger gains in general than those participating in the longest summer institute training program. This is corroborated by the interaction between degree of prior exposure and length of training program in the MANOVA analysis.

## IV. CONCLUSIONS

There is some evidence stemming from the comparison of data from the first and the second post-test that there is a curvilinear pattern of change in some of the variables studied. Teachers' gave higher ratings for almost all variables in the first post-test (at the end of each institute) than in the second. This is understandable given that the summer institute training programs remove teachers from their classroom settings and encourage an environment of mutual respect, learning, professionalism, and high motivation. The return to the classroom may result in increased awareness of the barriers to the implementation of new materials and strategies.

It is evident from the data analyzed, that teachers with low levels of prior exposure to international education materials and interactive teaching strategies experience the most initial change from pre-test to second post-test in their use of materials and strategies. It is possible, however, that small increments of change in the group of teachers with substantial prior exposure are comparable to large increments of change in teachers with low or no prior exposure, and that the nature of the change is qualitatively different. While the transition between innovation adoption and innovation implementation is not clearly defined, the change in teachers with low prior exposure corresponds most probably to an adoption phase. Teachers with high levels of prior exposure clearly do not change as much in their use of materials and strategies, but their competence and interest to use them are higher at the onset and remain higher throughout all measures. Their use of materials and strategies most probably corresponds to innovation implementation.

The relative stability of teaching practices was corroborated in this study. While some teaching practices appeared to change significantly (e.g., use of cooperative learning groups), most other teaching activities remained fairly constant across the three survey measures. Part of this stability is due to the fact that a summer institute training program alone is not likely to lead to categorical change in instructional strategies. The research literature on educational change suggests that several organizational and individual factors need to support change, and that change is an ongoing process. This notion is supported by the data in this study. Teachers in all sub-groups followed a fairly consistent trend of change regarding their use of specific activities and teaching strategies. The areas in which teachers scored significantly higher in the second-post-test survey corresponded primarily to perceptions of competence.

This study has demonstrated the importance of personal agency factors in general, and perceptions of competence specifically, in the implementation of educational innovations.

High levels of interests and perceived competence generate increased interest, competence, and use. Teachers in general felt more competent at the end of the summer institutes than they were at the beginning. Their perceived competence decreased slightly for all groups of teachers in the second post-test but remained higher than the baseline level. If perceived competence is indeed a better predictor of future performance than past or present performance, it is encouraging that a seven day to two-week program had an effect on teachers competence three to four months after the institutes. One implication of this finding is that programs attempting to implement change in teaching practices should aim at attracting teachers with high perceptions of competence or should try to increase those perceptions early in the training program.

Although there were some indicators that teachers changed in the actual use of international education materials and interactive strategies, the scores for use of international education materials in both the pre-test and second post-test are low. Further, these findings may be confounded by the nature of the survey questions. For example, there was one survey question that addressed use of international education materials in general rather than a number of questions that probed on the nature of those materials. The questions addressing use of interactive teaching strategies were more specific than those addressing use of materials. Although teachers scored significantly higher in their use of interactive teaching strategies in the second post-test, scores on specific teaching strategies indicate that teachers used some strategies to a greater extent than others. For instance, on the second post-test teachers reported using cooperative learning groups significantly more than on the pre-test, but there were no significant changes in teachers' use of simulations and role-plays. It is noteworthy that scores for perceived competence are consistent and similar to scores on use of strategies with teachers' reporting high perceived competence to use cooperative learning groups and low perceived competence to use role-plays and simulations.

Resource center affiliation emerged as the most important predictor of the outcome measures in this study. Affiliated teachers used international education materials and interactive teaching strategies to a greater extent than non-affiliated teachers, perceived greater school district and resource center support, and felt more interested and competent regarding the use of international education materials and interactive teaching strategies. This is not surprising given that the affiliation status provides teachers with a forum for professional development. Somewhat surprising, however, was the lack of significant differences between team and non-team members, since team members receive ongoing support and training opportunities than non-team members. In other words, they are the core of the affiliation structure. Further research is needed to determine what elements of

"affiliation" or "team-membership", account for the differences between affiliation and non-affiliation.

Several areas of analysis remain to be studied in order to better understand the relationship between the various independent measures and the dependent variables. For example, the number and nature of discrepancies between resource center staff and program participants in terms of ascribing affiliation or team membership remains under study as a possible indicator of organizational identity. Another area that deserves further attention lies in the understanding of the interplay between length of training and other program components.

One of the limitations of this study is that planned change is confined to global or international education training programs which incorporate innovative teaching strategies. This limitation is minimized by examining three different Summer Institutes in which naturally occurring variation is found. The analysis of other types of staff development programs not related to international education and/or programs that are not summer institutes or do not focus on interactive teaching strategies, would be of great value in the understanding of planned educational change.

Some possible areas of program variation, such as opportunities for behavioral rehearsals of new teaching practices, opportunities to acquire relevant content knowledge, and the balance between behavioral rehearsals and content knowledge presentations have been documented throughout this study, but have not been used in the final data analysis. Similarly, the effect of prior knowledge and content introduced in any of the training programs is an important variable in the analysis of change in teaching practices. This variable, however, has not been examined in this study.

The main reason for not including any of the preceding variables in this study is that it was deemed more appropriate to select variables that were not content-dependent and could be measured similarly across programs. However, the inconsistent pattern of findings from the summer institute with the intermediate length of training program indicates that variables other than length of training program were accounting for differences in scores. One such variable could be overall organization of the programs around "global or international education". The fact that global and international education are so broadly defined without much consensus as to what is encompassed in these fields makes it difficult to assess this variable and its association to change in teaching practices.

The results from the data analysis confirm that length of training, as measured in this study, was an important factor in teachers' use of interactive teaching strategies and

perceived competence to use them. It was also an important factor in teachers' perceived competence to give presentations, perceived competence in the field of international education, and interests in incorporating global or international education into courses. However, it is not clear that length of training program was the only variable operating in this factor, given that length of training was a dummy variable for the resource centers. Therefore, it is difficult to conclude in general terms, whether a longer program is better than a shorter one. On the one hand, it is difficult to argue against the possible benefits of providing teachers with as many opportunities as is possible for professional interaction, this being the condition that Dreeben (1973) and Lortie (1975) found so rarely in schools. Residential summer institutes that encourage participants to work together and incorporate new materials and strategies in a caring and supportive environment foster high perceptions of competence and control.

On the other hand, it is unclear, from the evaluation data collected during the three different institutes, that length of training was the only relevant factor in producing the desired outcomes for teachers. Other factors, such as organizational cohesiveness, or the degree to which participating teachers could rehearse or apply concepts and skills learned during the training program, may be just as relevant.

Important school culture variables such as the nature of collaborative planning and collegial relationships between different staff members, the presence of a sense of community, clear goals and high expectations for teachers and students, and an atmosphere of order and discipline have not been accounted in this study. This study does not address other important organizational variables such as existent levels of principal support and assistance in the implementation of the change, teachers' and school's experience with previous innovations, and district or school board's pressure for implementation. The data in this study regarding resource center affiliation and perceived organizational support suggest that further research is required to understand the nature of the support structures that are more closely associated with change in teaching practices.

Because change is a process and not an event, the total time frame from initiation to institutionalization is lengthy; even moderately complex changes take from three to five years (Fullan & Park, 1981; Hall & Loucks, 1977). However, change at the individual level occurs sooner than at the institutional level, and different aspects of change take more time than others. For example, the introduction of new materials into the subject matter of a class may occur much sooner than the use of new teaching strategies (i.e., simulations, cooperative groups, etc). A longitudinal study would be the optimal means of following a

planned change effort. While this study includes pre- and post- assessments of teachers' change, the total period between the pre- and post-assessment was at the most four months.

Perceived and actual support as well as shared goals between the different actors involved in a change effort are important variables that affect change at the individual level (Fullan 1982; Kritek, 1986; McLaughlin, 1984; Purkey & Smith, 1983). This study focuses on perceived support to a greater extent than on actual support under the assumption that perceived support is more relevant to influencing behavior than actual support. It is clear that there is a relationship between existent support structures and perceived support which deserves further study.

It is clear from the analysis of the data in this study that the factors leading to implementation of planned educational change efforts cannot be determined easily. While there is enough research evidence supporting the use of the factors included in this study in terms of explaining educational change, none of these factors fully explains the changes observed.

There are numerous interactions between the individual and organizational variables which require further research. To some extent, the discovery of such interactions adds validity to this project by reflecting what we already know: changes in people's behavior and motivations are complex and multidimensional.

## V. REFERENCES


Bandura, A. and D. Cervone.
"Self-evaluative and self-efficacy mechanisms governing the motivational effect of governing systems."
Journal of Personality and Social Psychology, 45, 1983, pp. 1017-1028.

Bussis et. al.
"Beyond Surface Curriculum"
Boulder, Colorado, Westview Press, 1976

Cuban, L.
"How Teachers' Taught"
New York, Longman Inc., 1984

Ford, D.
"Humans as Self-Constructing Living Systems."
Lawrence Erlbaum Associates, 1987.

Ford, M.
"Competence: Current Conceptual and Empirical Status and Implications for Mental Health."
State-of-the-science paper appearing in Behavioral Science Research in Mental Health (Vol. 2)
National Institute of Mental Health, 1983.

Ford, M.
"The Concept of Competence: Themes and Variations."
In Competence Development.
Edited by H.A. Marlowe and R.B. Weinberg.
1985

Fullan, M.
"The Meaning of Educational Change"
New York, Teachers College Press, 1982.

Fullan, M and Park, P.
"Curriculum Implementation: A Resource Booklet."
Toronto, Ontario: Ministry of Education, 1981.

Hall G, and Loucks, S.
"The Concept of Innovation Configurations: An Approach to Addressing the Politics of Educational Innovation."
Paper presented at the American Education Research Association annual meeting, 1981.

Kritek, W.
"School Culture and School Improvement"
Paper presented at the annual meeting of the American Educational Research Association. San Francisco, California, 1986.

Lortie, D.
"School Teacher."
Chicago: University of Chicago Press, 1975.

McLaughlin, M.
"Teacher Evaluation and School Improvement."
Teachers College Record.
Volume 86, Number 1, Fall 1984.

Purkey, S.C., and M.S Smith.
"Effective Schools: a review
The Elementary School Journal
(1983): pp. 427-452

Wise, A
"Why Educational Policies Often Fail: The Hyper-rationalization Hypothesis"
Curriculum Studies, 1977, 9 (1), pp. 43-57.
1977